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The ability to relay signals in real time will considerably increase our ability to deal with crises. During the recent Falkland Islands crisis, for example, it was necessary to move monitors, editors and teletypists from Panama Bureau to Asuncion. Had we had INTERNET, we could simply have moved as much of the signal as we wished from Asuncion to Panama.

### Coordination

The concept of INTERNET was well received by the DD/S&T in an extensive briefing presented by FBIS early in 1982. The DD/S&T as a result included the network concept in his guidance to D/FBIS on the FY-84 budget submission. The program was consequently included in the FBIS Modernization Plan and a five year funding profile developed. The plan includes equipment and personnel costs.

Because INTERNET involves communications, we have carried out extensive coordination and consultation with the Agency's Office of Communications. D/OC has indicated to the Comptroller and FBIS that he concurs with the planning steps taken and the need for INTERNET. The name INTERNET was developed to avoid confusion with OC activities in the congressional budget hearings.

A considerable amount of coordination has also been carried out with other agencies, specifically NSA and State. The NSA director of communications was briefed by FBIS and endorsed INTERNET. A series of meetings have been held with various State Department officials, including the under secretary for administration, the director of communications, the Chief of INR, and various legal officers. FBIS has agreed to keep State communications and legal officers informed of the progress of INTERNET.

Extensive liaison with foreign PTT's and U.S. military organizations will be necessary as the program evolves. In many cases assistance will be necessary to file appropriate forms and applications through both U.S. and foreign channels.

### Preliminary System Description

INTERNET will operate through a communications system with send and receive earth terminals at each individual bureau. These terminals will transmit to and receive signals from a satellite servicing the area. A particular bureau will transmit a signal to a satellite which will relay it back to earth where it will be recovered by the recipient bureau or Headquarters.

There are many technical details to be worked out. We must acquire the appropriate capacity on the satellites in question (two will be needed to connect all the bureaus -- one over the Atlantic and one over the Indian Ocean). We must define the size and character of the earth terminals, identify the location of a control terminal, and develop a protocol by which the network will operate. The size and character

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of the earth terminals will affect the amount of bandwidth that can be handled. The minimum requirement is a full time voice grade circuit to and from each bureau. Such a circuit will support the output of a receiver, a real time conversation between two individuals, multiple teletype channels or combinations of the above. Variables are the transmit power, modulation (FM, AM, digital) methods, and antenna size to ensure adequate quality of the signals.

Location of the earth terminal antennas will determine the permissible size and therefore system performance. Location on embassy grounds would be advantageous because the cost for the satellite rental would thereby be at U.S. domestic rates which typically are a factor of three less than foreign rates. While this is highly desirable it is not essential to the concept, and it is understood that some embassies simply cannot support antenna installations. Other options include acquiring separate land, collocating with host country earth terminal facilities, current FBIS antenna sites, etc.

Network protocol must be clearly established. One site's full utilization of the system in terms of data rate might preempt others. To avoid this we could rent more capacity on the space vehicle or increase antenna size. Present estimates are that this will not pose a major problem, and we should be able to move all the data we wish in real time.

We have contracted with Collins/Rockwell to study these issues. Technical parameters, tradeoff options, cost/schedule alternatives are being analyzed by Collins/Rockwell, an organization well experienced in satellite communications. The study will be carried out in FY-83 to provide a system definition for implementation beginning in FY-84.

#### Program Schedule

INTERNET has passed from the conceptual stage, through the initial coordination phases, and now is in the definition area. To this end it has been included in the FBIS Modernization Plan, incorporated in the FY 84-88 budget planning, and is the subject of continuous reevaluation as events unfold. At the current stage of planning the following is the projected schedule:

9/82 - 8/83	Definition study/analysis.
9/82-----	Liaison/coordination with State/NSA/others.
12/82 - 7/83	Field surveys of potential sites.
4/83-----	Coordination and formal application to foreign entities.
11/83 - 10/84	First phase implementation of INTERNET system (Procurement of equipment for selected sites)

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11/83 - 6/84	Aquisition of communications satellite lease.
6/84 - 6/85	Testing and initial operating capability (selected bureaus and relay station/node).
10/85 - 10/86	Additional bureaus equipped with earth terminals. Expanded interbureau ops and staffing complete.
10/86 - 10/87	Initiation of remote system hardware development, targeting, and planning. Final phase of INTERNET implementation. (Final bureaus equipped)
10/87-----	Ongoing operations finalized. Establishment of field organization and rotational aspects. Procurement of maintenance equipment and spares - determine life cycle/replacement schedule.

The need to phase INTERNET implementation is driven by several factors but the two most important are (1) realistic budget expectations and (2) the perceived difficulties in dealing with foreign entities. Additionally a phased approach lends itself to installing the terminals first in the areas or locations of least resistance and allowing the most difficult sites to be dealt with last, thereby providing the maximum time for foreign entity coordination.

#### Planned Actions

As part of the definition analysis now underway, Collins/Rockwell will survey various potential sites. As a result of these surveys, Collins/Rockwell will recommend terminal equipment of minimum cost and physical size but with performance levels needed for reliable communications. Collins/Rockwell will also provide a report along with accompanying documentation describing the frequency coordination within each particular country. The procedures to be followed shall be documented. Details of solutions to interference problems shall be documented in detail.

We will soon be asking selected bureaus to brief embassy officials and request permission for a survey team to visit. In some cases, the proposed site may well be the embassy itself and in others it will not. In all cases Headquarters will be requesting the bureaus to identify the local government officials responsible for frequency allocations, appropriate local construction contractors, and carry out such other liaison as may be necessary. One of the tasks of the survey team will be to identify the necessary forms to file and the procedures to follow to establish an earth terminal. Bureau officers will be involved

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throughout the survey and will participate in all Collins/Rockwell meetings with embassy and local officials.

FBIS Headquarters will maintain a constant dialogue with State and the military commands here at Washington in order to ensure their continuing support. Outside the government, Engineering Division will of necessity work closely with whichever contractor is selected to implement the INTERNET system. In addition, FBIS will have to develop working relations with INTELSAT (the international consortium that owns and operates the satellites themselves) and COMSAT (the U.S. representative to INTELSAT).

FBIS will have to recruit and train a technical staff that can maintain and operate the various INTERNET terminals. As currently envisioned the control terminal will be manned around the clock and also be the location of an emergency maintenance team. This team will be on call to service any malfunction. Each terminal should be manned by an operations officer after the initial activation phase. These positions are included in the budget for INTERNET.

The realization of INTERNET will have considerable effect on field operations. Some of the benefits are the capability for remote operations, teleconferencing and interbureau work load sharing. Other benefits will undoubtedly become apparent as the system evolves. Production Group has suggested a system of geographically distributed PMUs which would use INTERNET to reduce delivery time of printed news media. Other suggestions are welcome from all bureaus as INTERNET evolves and its capabilities become apparent.

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